CSCI 4131 – Internet Programming
Homework Assignment 6
Due Date: Tuesday: Nov 27th at 2pm
Late Submissions accepted (with Penalty) until Wed Nov 28th at 2am

1 Description

Assignment 5 provided an introduction to web-development using Node.js. This assignment builds upon what you developed with homework assignment 5. The objective of this assignment is to develop a basic website using Express. Express is an application framework that simplifies the development of node.js server-side applications, and it is the most widely used application framework for doing so. Typical features of Express are:

- routing: a way to map URls and http verbs to code paths
- easy methods for parsing http requests and building http responses:

*The following are **some of the resources** you should use to familiarize yourself with Express:*

- Essential
  - Installing Express
  - Hello world example of Express
  - Basic routing in Express
  - Serving static files in Express
- Extra
  - Express website
  - Books and blogs
  - FAQ
  - Routing in Express
  - API Reference
  - Building a Website with Node.js and Express.js (Video tutorial)

This assignment will also introduce you to SQL and the MySQL database.

The following are resources you should review to get familiar with SQL, MYSQL and MYSQL/Node.js

- ➢ Programming the World Wide Web (Sebesta) Chapter 13, Sections 1, 2, and 4
- ➢ https://www.w3schools.com/sql/
- ➢ https://www.w3schools.com/sql/sql_ref_mysql.asp
- ➢ https://www.w3schools.com/nodejs/nodejs_mysql.asp

2 Preparation and Files Provided

I. The first step will be to get Node.js and MySQL running on CSE lab machines. This can be accomplished as follows:

1. Log into a CSE lab machine.
2. Most of the CSE lab machines run version 8.9.4 of Node.js
3. Open the terminal and type the following command to add the Node.js module:
   ```
   module add soft/nodejs
   ```
4. The next step is to check the availability of Node.js. Type the following command to check the version of Node.js on the machine:
   ```
   node -v
   ```
5. This will display the current installed version.
6. To use the MYSQL database, you will need a database user id and password. Your MYSQL database user id and numeric password can be found on the class Moodle site. The user name and password are separated by a space.
7. At the terminal, type the following command to add MySQL module:
   ```
   module add soft/mysql
   ```
8. At the terminal prompt, type the following command to login to MySQL and check whether its active:

   mysql -uYOUR_DATABASE_USERID -hcse-curly.cse.umn.edu -P3306 -pYOUR_DATABASE_USERID

   Replace **YOUR_DATABASE_USERID** with the database id provided to you before hitting enter. **YOUR_DATABASE_USERID** will be in the format: **C4131F18GXXX**

   You can find **YOUR_DATABASE_USERID** and **mysql** *password* on Moodle with your HW assignment, in-class exercise, and exam grades. The Feedback section of the Grade item named UserID_Password contains **YOUR_DATABASE_USERID** and numeric **mysql** *password*. **DO NOT SHARE YOUR_DATABASE_USERID and numeric mysql *password* with anyone.**
9. When prompted for password, enter the numeric mysql password provided to you.
10. After successful login, you should see **mysql>** prompt.

II. The second step is to create a Node.js (Express) project for this assignment. This can be accomplished as follows:

1. Open the terminal on a CSE lab machine.
2. Create a directory named <x500id_hw05> by typing the following command:
   ```
   mkdir yourx500id_hw06
   ```
3. Go inside the directory (folder) by typing the following command:
   ```
   cd  yourx500id_hw06
   ```

4. Having a file named *package.json* in Node.js project makes it easy to manage module dependencies and makes the build process easier. To create *package.json* file, type the following command:

   npm init

5. The *npm init* command will prompt you to enter the information. Use the following guidelines to enter the information (The things that you need to enter are in **bold** font. Some fields can be left blank.):

   ```
   name: (yourx500id_hw06) yourx500id_hw06

   version: (1.0.0) <Leave blank>

   description: Assignment 6

   entry point: (index.js) <Leave blank> (You will create an index.js
   file for your use)

   test command: <Leave blank>

   git repository: <Leave blank>

   keywords: <Leave blank>

   author: yourx500id

   license: (ISC) <Leave blank>
   ```

6. After filling in the above information, you will be prompted to answer the question: "`Is this ok? (yes)`". Type **yes** and hit enter.

7. Listing all the available files in the directory should display the following:

   ```
   drwx------  4 nayan003 CSEL-student    7 Mar  3 03:50 ./

   drwx------ 12 nayan003 CSEL-student   17 Mar  3 03:50 ../

   -rwxrwxrwx  1 nayan003 CSEL-student  309 Mar  3 03:37 package.json
   ```

8. Install Express by typing the following command:

   npm install --save express

9. You can use any npm module that you deem fit for this assignment. Some npm modules that might be useful for this assignment are and should be installed are:

   - mysql (*npm install --save mysql*)
   - body-parser (*npm install --save body-parser*)
   - express-session (*npm install --save express-session*)
   - sha1 (*npm install --save sha1*)

10. You are free to decide your own project structure for this assignment.

NOTE: We have provided a sample server file (sample_index.js) which can be used for reference.

III. Database setup:

1. In addition to a sample server file (index.js) and the welcome page (welcome.html), the following files have been provided to you for this assignment:
   - create_accounts_table.js
   - insert_into_accounts_table.js
   - create_events_table.js

2. Download these files and move them to **`yourx500id_hw06`** directory.
3. Edit these files as per the instructions provided inside these files.
4. At the terminal, type the following command to create the MySQL table: tbl_accounts

   ```
   node create_accounts_table.js
   ```

   This table will be used to store your encrypted login credentials.

5. At the terminal, type the following command to insert values for acc_name, acc_login, acc_password into tbl_accounts table:

   ```
   node insert_into_accounts_table.js
   ```

   You will use the values chosen for acc_login and acc_passowrd to login to the website. Keep the values in a safe place and do not share them with anyone

6. At the terminal, type the following command to create the MySQL table: tbl_events

   ```
   node create_events_table.js
   ```

   This table will be used to store the details of the events.

At this point you are ready to start the website development.

3 Functionality

Your website will have 3 pages:

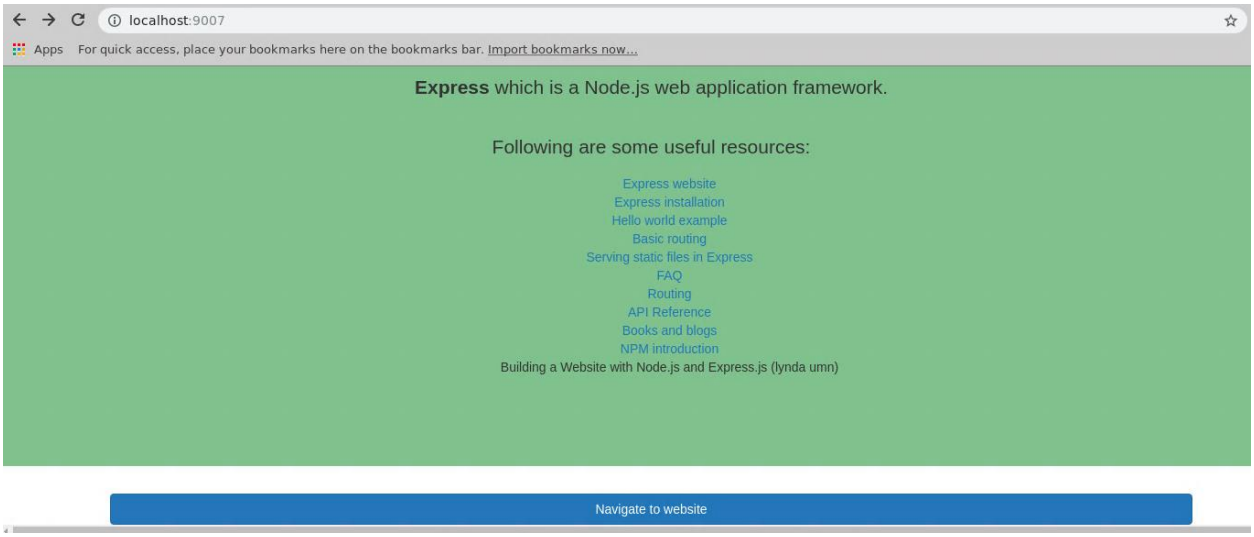
- A **Welcome** Page (welcome.html - provided to you)
- A **Login** page
- An **Events places** page
- An **Add Events** page

The *Events places* and *Add Events* pages will have a navigation bar with logout button.

NOTE: You will need to develop the entire website including frontend (HTML pages, CSS, Javascript) and backend (Express server).

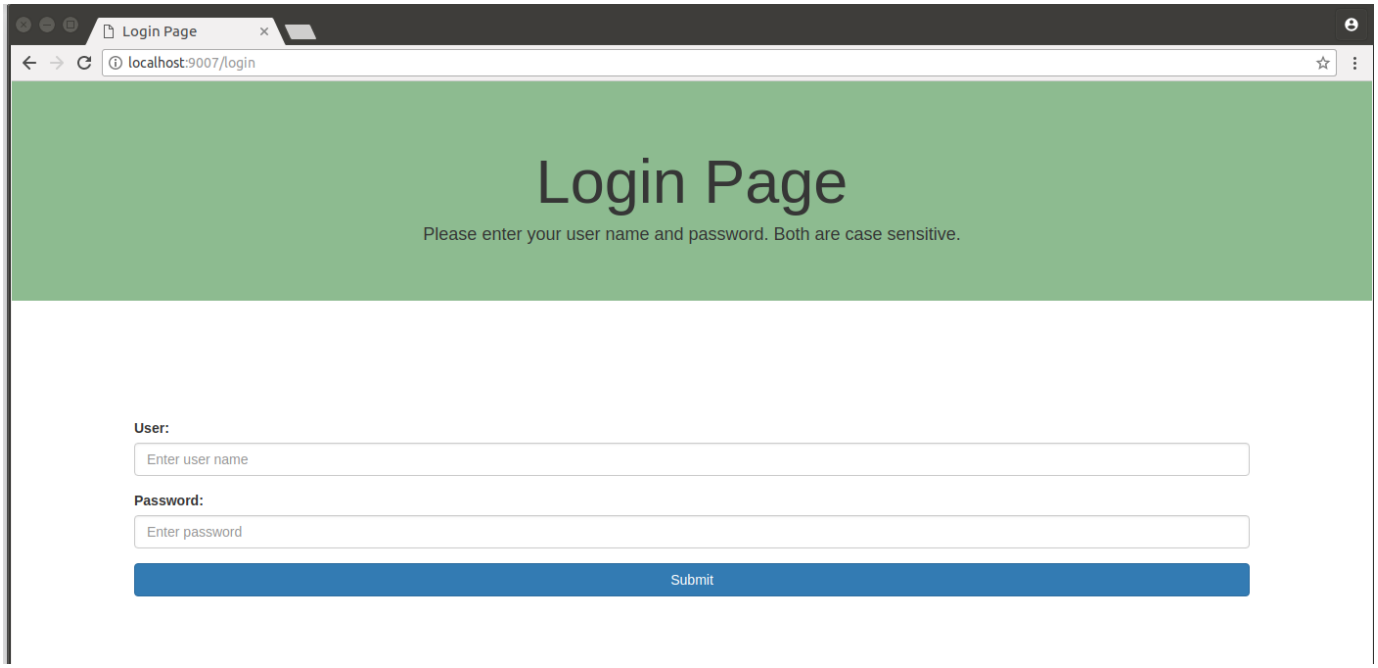
Follow the instructions provided below:

Welcome Page



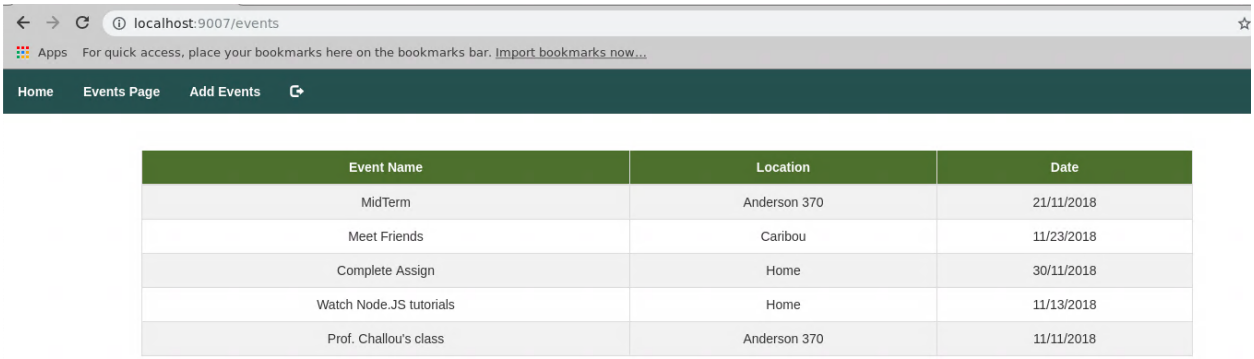
- The Welcome page (welcome.html) is already provided to you and is rendered at the default route "/"
- On Clicking Navigate to website, you would be redirected to the /login route and you need to start your development from here

Login page



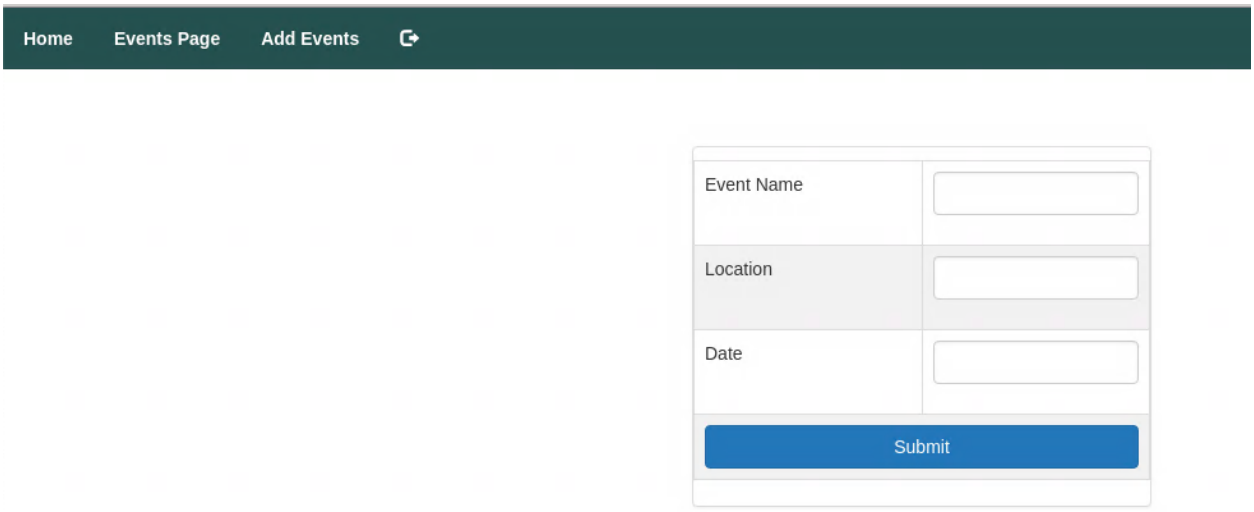
- This Login page should have a form with two fields: “User”, and “Password”
- Both these fields are mandatory.
- When the submit button is clicked, the values entered for “User” and “Password” should be sent to the server for validation before allowing further access to website.
- The server will validate the received values against the *acc_login*, and *acc_password* fields of *tbl_accounts*. Passwords are stored in the database in a SHA1 hashed format in tbl_accounts. The server should convert the received password string into a SHA1 hash format and compare it to the SHA1 hashed password stored in the database. (*Hint: you can use sha1 npm module*)
- Upon successful validation, the server should
    - Create a user session (*Hint: you can use express-session module*).
    - Send a response back to client indicating successful validation.
- If the validation fails, the server should:
    - Send a response back to client indicating validation failure.
- If a successful response is received from server, the “Events” page should be displayed, otherwise the appropriate error message should be displayed to the user (Check screenshots towards the end of this assignment)

Events page



- If a user tries to access this page without a valid login, the user should be routed to “**Login**” page.
- The page should have a navigation bar with a logout button.
- The table in this page should be dynamically populated.
- To achieve this, the server should provide a GET API which returns the list of events. This API will be very similar to the one developed in assignment 5. It will get the list of events by querying the following table: tbl_events.
- The client will call this API using AJAX and populate the table using the data received from the server.

Add Events page



- You can use the form developed in assignment 5 for 'Add Place' page.
- If this page is accessed without a valid login, the user should be routed to "**Login**" page.
- The page should have a navigation bar with a logout button.
- Upon clicking submit, the form data should be posted to the server.
- The server should insert the received data into the following table: **tbl_events** (*Hint: you can use mysql module*)
- The mapping between form fields and table columns is:
    - Event Name: **event_name**
    - Location: **event_location**
    - Date: **event_date**
- Upon successful insertion, server should route the user to the "Events" page.

Logout button

- Upon clicking the logout button on the menu-bar, the user session should be destroyed and user should be routed to **Login** page.

4 Submission Instructions

PLEASE ENSURE TO TEST YOUR CODE ON CSE LAB MACHINES.

You will need to submit all the files used to develop your website. This includes all the HTML, CSS, JavaScript, package.json, index.js and any other files.

Towards this end, make a copy of your working directory: `yourx500id_hw06`. Rename the copied folder as **yourx500id_express**.

Create a README file inside yourx500id_express directory. This README file should include: Your x500id, acc_login, and acc_password values from insert_into_accounts_table.js file.

Compress the **yourx500id_express** directory and submit it**.**

We will use the acc_login and acc_password values to login to your website. Ensure that these values are correct and can be used to access your website.

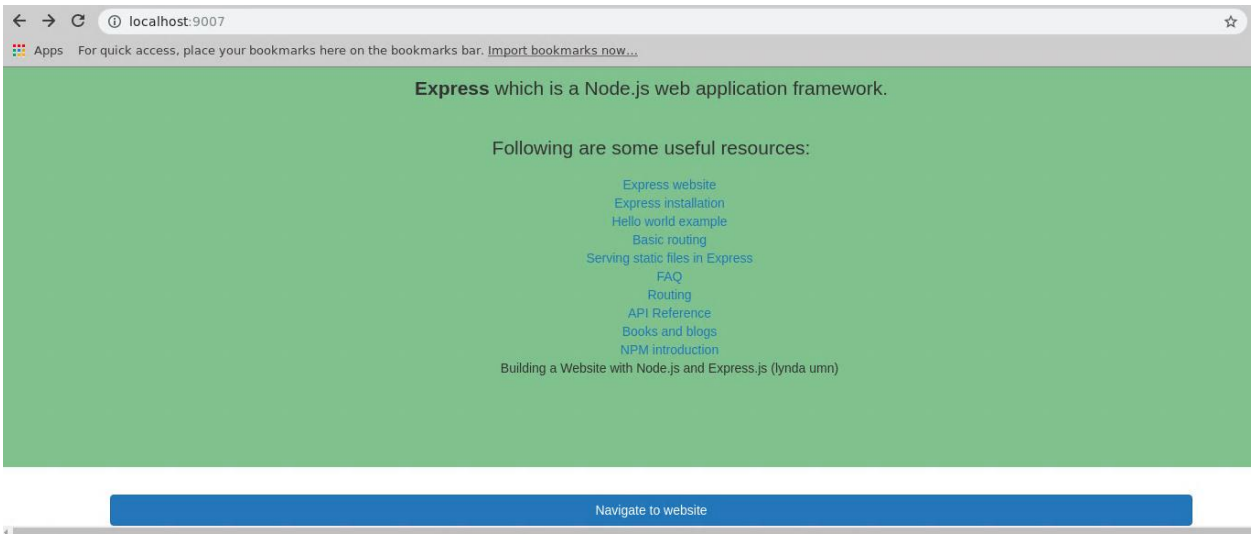
5 Evaluation

Your submission will be graded out of 100 points on the following items:

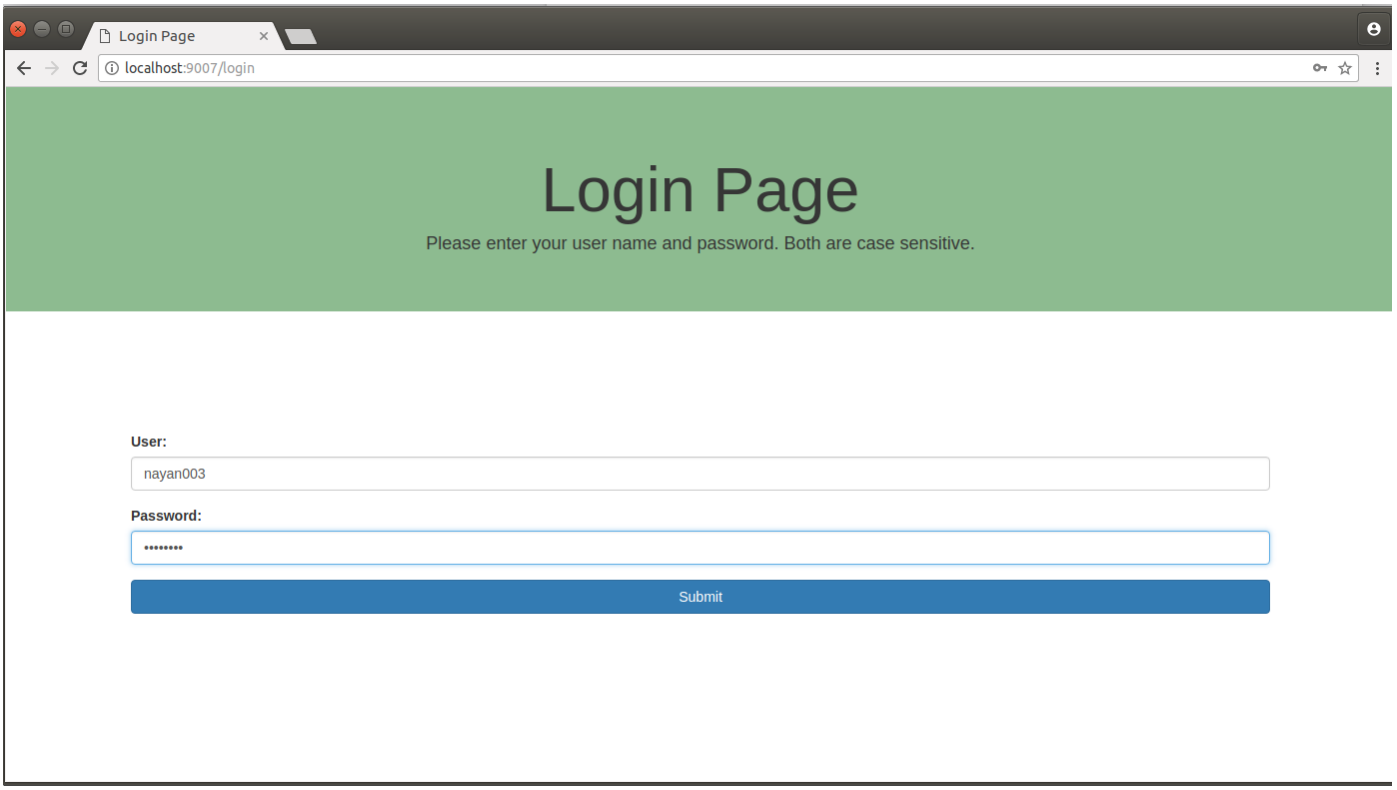
- The "Events" and "Add Events" pages of your website redirect the user to "Login" page automatically before authentication. **(10 points)**
- The "Login" page shows the form elements and submit button. **(5 points)**
- After successful login validation by the server, the "Login" page redirects the user to "Events" page. **(10 points)**
- If server login validation fails, an error message is displayed on "Login" page and user is not allowed further access. **(10 points)**
- The "Events" page displays correctly and has operational navigation bar. **(5 points)**
- The "Events" page gets the list of favorite places from server. The favorite places are dynamically added to the table displayed in the user's browser. **(20 points)**
- The "Add Events" page displays and has an operational navigation bar. **(5 points)**
- The user can add a new event using the form present in "Add Events" page. **(20 points)**
- After a new event is added using the "Add Events" page, the user is redirected to "Events" page, and the user's events are correctly displayed. **(5 points)**
- The logout functionality works correctly. **(10 points)**
- Submission instructions not met (**-5 points**)

6 Screenshots (See the images below and on the following pages for examples)

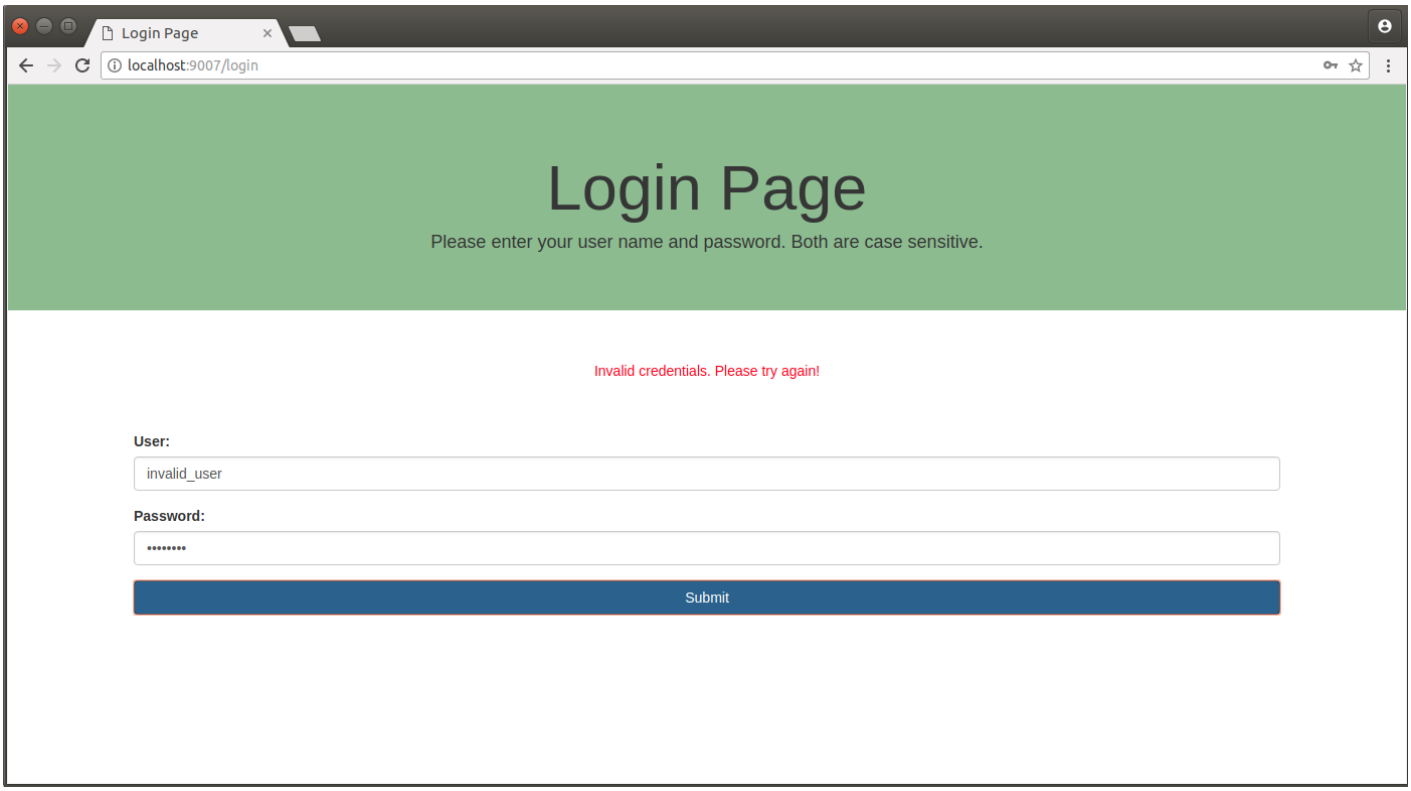
Welcome Page



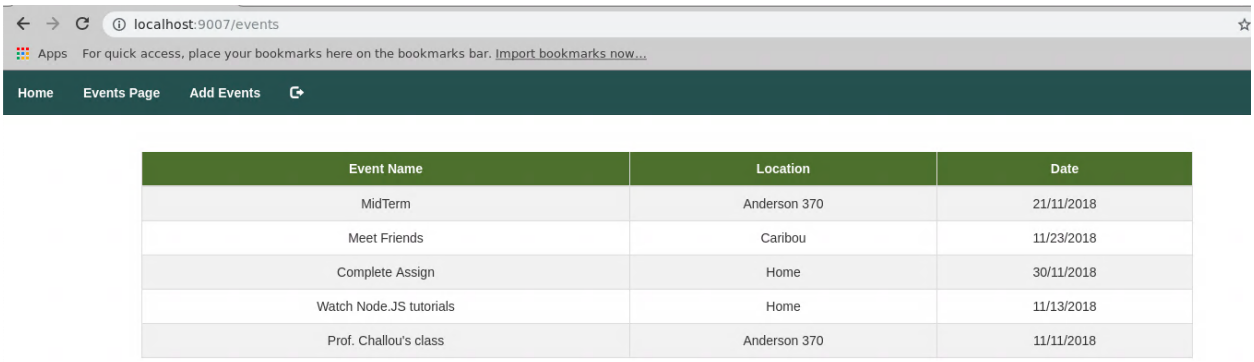
Login Page



Invalid Login

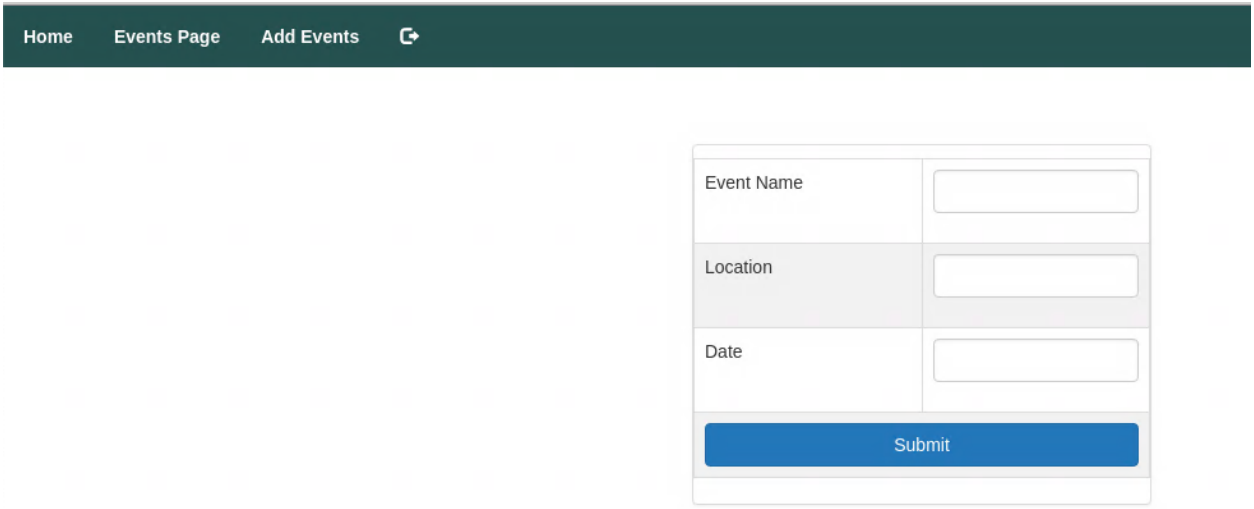


Events Page



Event Name	Location	Date
MidTerm	Anderson 370	21/11/2018
Meet Friends	Caribou	11/23/2018
Complete Assign	Home	30/11/2018
Watch Node.JS tutorials	Home	11/13/2018
Prof. Challou's class	Anderson 370	11/11/2018

Add Events page



Navigation bar